

ANNUAL REPORT FOR 1974

annual report for 1974



INSTITUTE FOR ROAD SAFETY RESEARCH SWOV

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Foreword

The foreword to the Annual Report of 1973 dealt thoroughly with the Governmental authorities' increasing requirement for scientific data; the sudden growth in the activities of SWOV in this connection; and the resulting financial problems of the Institute.

It is satisfactory to note that an important step has been taken to solve these problems by the establishment of a new financing system. Both the Ministry of Transport and Waterways and the Ministry of Public Health and Environmental Hygiene showed an understanding (in the relevant discussions), of the fact that the trend as indicated above, would result in too heavy financial commitments by private organisations, who also sponsor SWOV's activities. The financial contribution by private organisations guarantees the independence of the Institute. This independence is also regarded by the Governmental Authorities as an essential condition for a satisfactory balance between research and policy.

Undertaking an ever increasing volume of research and the dissemination of data obtained therefrom, leads to an increase in the reputation of SWOV, and this in turn, leads to requests for carrying out activities far beyond the scope of its original concept. When accepting assignments therefore, the extents of any direct relationship between the basic tasks of SWOV and the assignment, must be taken into consideration; also, whether the execution of the required activities could be of importance in relation to the proper functions of SWOV.

As a result of this, quite a number of assignments (which by themselves would certainly have been of interest) had to be refused, since there would not have been sufficient time for other research. Nevertheless, in 1974 there were more than 30 courses and lectures given by SWOV researchers both at home and abroad.

The international exchange of information with, among others, universities and governmental authorities, created contacts with 25 countries.

Th. J. Westerhout, Chairman of the Council

Introduction

There is a growing tendency that social policies should be directed according to certain pre-determined guide-lines, even if they do not relate to the immediate future. This principle has led to the establishment of interdepartmental consultation, for the preparation of the policy for road safety. The theories and strategies now under development will be incorporated in a national policy plan for road safety.

SWOV has been commissioned to supply the basic scientific components for this plan, within a short period, and covering several phases. A working group has been set up within the institute, in order to fulfill this large-scale assignment, while at the same time causing the least delay to the other research projects. The first four chapters have already been completed in 1974.

It is justified to hope, that a policy based to a large extent on socially more acceptable long-term strategies than those at present, will replace a policy in which individual aspects are primarily emphasised; but this does not mean that individual issues will be discounted in the determination of road safety policy. Also sufficient room must be made, within the scope of long-term strategies, for individual problems.

In 1974, SWOV was extensively involved (within the framework of previously made policy-preparatory research arrangements) in the preparation of a number of measures, which had to be implemented quickly; for example, the amendment of the Act concerning alcohol consumption, the compulsory use of crash helmets by moped drivers, the compulsory use of seat belts.

The most effective system of co-ordination between policy and research results from three factors: a policy-preparatory research programme, the implementation of the policy, and subsequent evaluation research. By applying these factors it is possible to forecast to some extent the effect of the measures to be taken; then, after a certain period of operation of the measure, to assess its effect. In this way it is also possible to take more effective measures, and to optimise them at a later date. This statement does not exclude the possibility of evaluating policy measures set up without SWOV-research, provided that SWOV has at its disposal sufficient data concerning the situation prior to the implementing of the measure in question.

E. Asmussen, Director

The Institute

The Council of the Institute for Road Safety Research SWOV was organised as follows at 31st December 1974:

Th. J. Westerhout, Chairman

Th. van der Meer, Deputy Chairman

on the recommendation of the Nederlandsche Vereeniging De Rijwiel- en Automobielenindustrie RAI (Netherlands Association of Bicycle and Automobile Industry RAI)

J. Volmuller, Secretary

on the recommendation of the Minister van Onderwijs en Wetenschappen (Minister of Education and Sciences)

J. D. J. Idenburg, Treasurer

on the recommendation of the Nederlandse Vereniging van Automobielen Assuradeuren (NVVA) (Netherlands Association for Automobile Insurance NVVA)

H. A. M. Elsen

on the recommendation of the Minister van Volksgezondheid en Milieuhygiëne (Minister of Public Health and Environmental Hygiene)

C. A. Kuysten

on the recommendation of the Koninklijke Nederlandse Toeristenbond ANWB (Royal Dutch Touring Club ANWB)

J. P. Neeteson

on the recommendation of the Minister van Verkeer en Waterstaat (Minister of Transport and Waterways)

B. Schultsz

on the recommendation of the Koninklijke Nederlandsche Maatschappij tot Bevordering der Geneeskunst (Royal Netherlands Medical Association)

A. J. Fontein

on the recommendation of the Minister van Justitie (Minister of Justice)

J. M. de Graaf

on the recommendation of the Minister van Binnenlandse Zaken (Minister of the Interior)

Th. M. J. de Graaf

on the recommendation of the Vereniging van Nederlandse Gemeenten (Netherlands Association of Local Authorities)

H. Zandvoort

on the recommendation of the Vergadering van Hoofden van Provinciale Waterstaatsdiensten (Joint Directors of the Provincial Bureaus of Public Works)

In personal quality:

H. A. W. Nijveld

head of the Economisch Technische Afdeling van de Centrale Organisatie TNO (Economic Technical Department of the Central Organisation for Applied Scientific Research TNO)

The seven members first mentioned are forming the Executive Committee

Due to changes in his work, Mr. J. W. Tops resigned from membership of the Council as from January 1, 1974. As successor to Mr. Tops, Mr. J. P. Neeteson, Director-in-Chief of the General Board of Roads and Waterways, was elected by Council as member of the Executive Committee.

In February 1974 Mr. G. Dekker asked to be relieved from his function and was succeeded by Mr. B. Schultsz.

The bureau is directed by E. Asmussen.

Policy plan for road safety

On May 3, 1974 the Ministry of Transport and Waterways requested SWOV to investigate the possibilities of providing contributions for a national policy plan for road safety. On November 5, 1974 SWOV was commissioned to provide the required components for such a policy plan. In the order, the Minister expressed his wish that the policy plan — (similar to the 1967 Road safety memorandum) — should contain an appendix giving descriptions of all the factors affecting road safety, together with their mutual inter-relationships. According to the Minister the 'Contributions to the Road safety memorandum' provided by SWOV in 1965, were of great importance to his predecessor, and provided the starting point for the establishment of his policy. For this reason the present Minister of Transport and Waterways requested SWOV to carry out a similar series of studies.

The order is divided into three phases, of which only the first had to be completed in 1974 (i.e. a global description of road traffic (un)safety, together with the compilation of the extent of present knowledge).

In order to undertake this phase of the order, a working group has been formed within SWOV, the members of which spending most of their time establishing the components. In 1974, reports concerning road safety policy, the volume and development of road traffic (un)safety and surveys covering scientific knowledge obtained from investigations concerning road safety, have already been submitted to the Road Safety Directorate DVV of the Ministry of Transport and Waterways.

The second phase of the order comprises the execution of an extensive analysis of the problems. On the basis of this analysis it will be possible to investigate a number of alternative measures and their possible consequences; these measures will be founded on principles formulated in later stages of the policy plan. If sufficient data are available, the report covering the activities of the second phase will be supplemented by a cost/benefit analysis.

Based on information obtained from the first two phases, a programme will be drawn up for future investigation.

Research projects

1. Basic research

The following research activities are necessary to establish priorities, forecasts, analysis of traffic safety problems, improved methods of research, and the development of theories for future research. These activities do not have any corresponding policy measures, to be implemented in the near future.

Breath analysis methods

The results of tests on apparatus for breath analysis during the roadside surveys on drinking and driving during the previous year, became available in the first quarter of 1974. These have been processed statistically. A report has been made of the experience gained, in using the apparatus, for internal publication. Part of this internal report, together with statistical data, was presented in the form of a paper, read at the 6th International Conference on Alcohol, Drugs and Traffic Safety, Toronto, Canada (see page 29).

Based on the favourable results obtained using certain types of apparatus, it was decided to use breath analysers exclusively during the small scale investigation into the short term effect of implementing the amended Article 26 of the Dutch Road Traffic Act on the 1st November, 1974.

The evaluation of new developments in the field of breath analysers was also continued during the year under review.

Analysis of the driving task

1. Selection and maintaining of course, lateral position and speed

Draft reports have been prepared, based on the test drives executed on the Vaanplein in 1973 (Institute for Perception TNO) and aerial surveys (Survey Department of Rijkswaterstaat). These reports have been discussed by a working group composed of members of the staff of the Roads Directorate and the Traffic and Transportation Engineering Division of Rijkswaterstaat DVK and SWOV.

The final report will, in general, emphasise the recording of perception and driving behaviour and their mutual relationship, the merits of several different methods of measurement and recording, for the registration of certain traffic situations (in connection with the project for traffic flow models) and methods for visualising road design.

2. Perception of other vehicles

Laboratory and field research carried out by the Institute for Perception TNO has been completed in 1974.

The most important results from these research operations have been incorporated in a report to the Interdepartmental project group on Vehicle perceptibility.

3. Route-guidance

In 1974 a start was made on long-term research into Route-selection and guidance.

4. Functional field of vision

The preliminary laboratory tests by the Institute for Perception TNO, concerning the processing of information relating to the functional field of vision, have been completed.

The results give information on the decision taking procedure by road users at situations alike intersection points.

5. Traffic signs

The investigations into the intelligibility of various symbols and texts on subsidiary boards of traffic signs, started in 1973, have been completed, with a final report supplied to the assignor.

SWOV was requested by the Ministry of Transport and Waterways to obtain from the Institute for Perception TNO, a search of the literature covering the legibility of road traffic signs along motorways, which may be considered as supplementary to the prior SWOV report on road traffic signs. The results could be made available to the assignor in 1974.

Standards for participation in traffic

Compiling the literature and establishing the analysis of the problems in the field of education, has been continued in 1974. A summary of this analysis has been presented, as contribution, to the OECD Research Group S10: Driver Education and Training (see page 30).

As a contribution to a study of the performance of candidates for driving test (during the practical part of the test), material has been collected, in co-operation with the Central Bureau for the Issuance of Driving Licences CBR.

A start has been made on research into traffic education, this research has already been mentioned in the 1973 Annual Report and has been carried out (in co-operation with the Groningen State University; Traffic Studies Project Group: Prof. dr. J. A. Michon).

The preparatory phase covered:

1. An analysis of the objects and the practice of present day traffic education;
2. An analysis of the possibilities for evaluating the education methods applied;
3. Establishment of a detailed research programme.

It is planned to finish the preparatory phase about the middle of 1975.

Driver/vehicle cybernetic model

Work on the search of literature, the theoretical analysis and inventory of methods of research, the required apparatus, and the determination of problem areas, has been

continued. These activities cover, on the one hand, the study of recent developments and results of the man/machine system in the widest sense, and on the other hand, specific research concerning the relationship between driver, road and vehicles in traffic situations.

With regard to the ridability of two-wheelers (bicycles and mopeds), to which priority has been given within the part-investigation 'Response characteristics of special vehicles', a state of the art report is being prepared. In this report ridability is analysed, along with and in connection with research concerning the rider/two-wheeler system, from different angles such as traffic observations, experimental research (riding tests) and research into the dynamics of the vehicle.

The field tests carried out by the Institute for Perception TNO in co-operation with the Research Institute for Road Vehicles TNO, with the aid of a so-called 'instrumented' bicycle, have been supplemented this year by using two-wheelers (bicycles and mopeds) of the normal commercial quality. The selection of these two-wheelers according to their specific vehicle configuration, and the choice of manoeuvres, external circumstances and riding-instructions, are based on the results of tests obtained from the instrumented bicycle. The first draft of the report on the above-mentioned experiments together with the state of the art has already been completed. Within the framework of problem areas, preparations have been made for research into wind-hindrances to road traffic.

Categorising of roads

In the second half of 1974 SWOV drew up a preliminary advice for the Congress of the Vereniging 'Het Nederlandsche Wegencongres', under the heading of 'Traffic safety as a criterion for road design', with an introduction entitled 'Characteristics of road traffic'. In this preliminary advice a detailed explanation is given of road categorising.

Information systems in road traffic

The inventory of developments in the field of information systems concerning road traffic, in the countries of Western Europe, the United States and Japan has been completed. A draft report has been prepared on the relevance of these systems for the Netherlands. On the basis of this report a research design has been elaborated for assessing the effect of a system of signals for blind bends.

An inventory of automatic incident-detection systems is under preparation.

In addition, a detailed plan has been drawn up for the evaluation of queue safety systems.

Traffic flow models

The general search of the literature concerning traffic flow models for arterial roads is being continued. A report on adequate measuring methods has been completed.

Supplementary information on the characteristics of a measuring system, suitable for traffic flow studies, will be obtained from experiments, which have been started in 1974, with the co-operation of the Transportation Research Laboratory of Delft University of Technology.

In addition to the completed parts concerning average traffic flow parameters in general, other parts, dealing with specific parameters, such as a distributions and acceleration noise, will be completed within a short time.

As was done in 1973, a contribution has been made from the theory of traffic flow, to an investigation into the effect of a traffic-dependent signalling system.

Mathematical models for crash-research

1. Mathematical model of the vehicle exterior and the surroundings

The model developed by Prof. V. Giavotto (of the Istituto de Ingegneria Aero-speziale de Politecnico di Milano) for roadside safety structures, has been extended. A start has been made on the development of part-models for obstacles; while the modified vehicle model, which is deformable on all sides, is already in an advanced state of development.

2. Mathematical model of vehicle interior and the passengers

In co-operation with the Research Institute for Road Vehicles TNO, a start has been made on the development of two and three-dimensional models of vehicle passengers, simulating the vehicle interior, at the same time.

A further objective is to combine both models, at a later date, i.e. the model vehicle exterior-surroundings and the model vehicle interior-passengers. In this way, a universal mathematical model will be available.

2. Policy-preparatory research

This research provides recommendations for measures which the Authorities intend to take.

Safety of children in passenger cars

Regarding safety measures intended for children in passenger cars, a working group has been set up in accordance with the order of the Minister of Transport and Waterways. This working group, composed of members of the staff of the Department of Road Transport RDW, the Research Institute for Road Vehicles TNO and SWOV, submitted a preliminary report to the Minister of Transport and Waterways covering the requirements which restraint systems for children have to comply with.

Vehicle perceptibility

The final version of this report has been submitted to the Interdepartmental project group concerned. At a later date and after due discussion the report will be amplified by more definite technical specifications; after which 'follow-up' activities will be undertaken.

On the basis of a report submitted earlier to the Interdepartmental project group concerned on the visibility of the rear of bicycles in the dark, and as an extension thereof, discussions were held on the necessity for supplementing the rear light of bicycles with a retroreflector and the required specifications.

More detailed information has been given, relating to an earlier recommendation for the Royal Dutch Army to use lights on military vehicles during the day-time.

Tyres, road surfaces and skidding accidents

The results of the project Tyres, road surfaces and skidding accidents, has now reached a stage where modifications to the outline of the project seem advisable. In order to formulate concrete policy measures an Interdepartmental project group will be set up. A start has already been made, by summarising the research results and by preparing the outline of a new analysis of the problem.

Sub-committee I (Research into the relationship between frictional forces, road surface and tyre characteristics and speed; experimental multifactor research).

The tests on tyres (for passenger cars), which were carried out on the test-track constructed at Woensdrecht Airbase, established mathematical relationships between

braking force and lateral force coefficients on the one hand, and between road surface characteristics and speed on the other hand.

In order to find out whether lorry tyres have other requirements with regard to the road surface geometry, tests have also been carried out with lorry tyres. On the test-track and on some public roads limited tests on lorry tyres have been carried out with the single-wheel measuring trailer of the Vehicle Research Laboratory of the Delft University of Technology. Recommendations concerning the roads to be used have been obtained from the State Road Laboratory, and for the tyres from N.V. Vredestein, Enschede. The test project and processing of the results is being undertaken by the Institute of Mathematics, Information Processing and Statistics TNO (IWIS-TNO). For a part of the report, films were made by the Foundation Film and Science SFW.

Sub-committee II (Experimental and analytical research into the relationship between the braking force distribution, and its implications for deceleration and the stability of the vehicle).

At the request of the Department of Road Transport RDW a start was made with establishing functional requirements concerning auxiliary brakes for lorries and trucks and trailer combinations. In this respect, co-operation has been achieved between the Vehicle Research Laboratory of the Delft University of Technology and the motor car industry (DAF).

As a result of the high priority of this part-investigation, a Interdepartmental project group on Braking force distribution has been formed, preceding the foundation of an Interdepartmental project group for the entire project Tyres, road surfaces and skidding accidents; Sub-committee I¹ functions within this framework under the name 'Ad-hoc working group for secondary brakes'.

Roadside obstacles

1. Obstacle-free zone

The research project 'Obstacle-free zone', under the control of the Interdepartmental project group on Roadside obstacles, aims at determining a required width for the sides of the roads of various categories so that an acceptable measure on safety can be guaranteed. The object is to establish a relationship between the distance of the obstacle (as the primary parameter) and the road edge, on the one hand, and the relationship between the number of accidents and the obstacles causing them, on the other hand. Originally, attempts were made to isolate the variables which might have an effect on the comparison of road sectors, using data obtained during the investigation into the safety on the roads in De Beemster polder. However, due to variations in the roadside width this was not possible.

Subsequently an investigation was carried out using an inventory of traffic and road characteristics and accident data, compiled in the province of Gelderland. The results obtained from this seem to be satisfactory. It is planned to extend this study by tests on further provincial roads and motorways.

2. Lamp posts

Rigid lamp posts are dangerous to vehicles and their drivers if the vehicles go off the road.

An experimental part-investigation, also under the control of the Interdepartmental project group on Roadside obstacles, aims at finding out whether it is possible to decrease the collision resistance of lamp posts to such an extent, that in the event of collisions, the danger to the car passengers could be reduced to a minimum. For this purpose tests are made, comparing aluminium lamp posts with no special safety construction, and steel lamp posts, with special safety constructions, the basic principle being that the lamp posts should break or become sheared, close to ground level.

Slow moving traffic in built-up areas/Pedestrian safety

During 1974 a series of reports on the safety of pedestrians has been submitted to the Interdepartmental project on Slow moving traffic in built-up areas, some of these reports having already been published in Dutch. On the basis of these reports discussions are held on the policy measures to be followed. For this purpose, there is close contact with the Interdepartmental working group for Road safety in residential areas.

In the meantime a start has been made on developing a technique of observation which can be substituted as a measuring device for traffic accident statistics. This novel observation technique has been developed by laboratory and field experiments. For the field experiments, two residential areas in Delft have been chosen, which differ from one another with respect to the principles of town-planning. The execution of the project is being undertaken by the Netherlands Institute of Preventive Medicine TNO (NIPG-TNO).

Road safety in country districts/Investigation into the safety on the roads in De Beemster polder

Regarding the investigation into the safety on the roads in De Beemster polder, a report has been submitted to the Working group Road safety, in the municipality of De Beemster.

In order to elaborate more thoroughly the proposals given in this report, the investigation is being continued with, among others, considerations of the costs and the benefits of various road safety measures in De Beemster polder. Data from this investigation are submitted to the Working group concerned.

3. Evaluation research

Research into the effects of Governmental measures and safety campaigns.

Drinking and driving

The results of the blood analyses from the roadside surveys carried out in the autumn of 1973, became available at the beginning of 1974. After processing these, an analysis of the results of the survey was carried out. Papers were read on the most important results from the three roadside surveys (1970, 1971 and 1973); and a report has been compiled and submitted to the 6th International Conference on Alcohol, Drugs and Traffic Safety, in Toronto, Canada, and to the International Conference on Research Methodology for Roadside Surveys of Drinking-Driving in Paris (see p. 29).

Prior to 1974, no roadside survey had been planned, because the amendment of Article 26 of the Dutch Road Traffic Act was only implemented on the 1st November 1974 and the surveys were planned to determine changes in drinking and driving habits over a longer period. However, mainly on account of the great interest in the proposed amendment to the Act, at the last moment it was decided to carry out limited research into the short-term effects of the amendment. For this purpose, on one week-end in October and on two week-ends in November, roadside surveys were carried out, with the co-operation of the Netherlands Institute of Statistics. By making exclusive use of breath analyses and by shortening the questionnaire, the processing capacity of the three investigating teams was increased to such an extent that a total of 1800 test subjects was investigated during the three week-ends.

Crash helmets for moped riders

1. Publicity campaign on Moped riders' crash helmets

In the autumn of 1973 a start was made with four semi-annual enquiries relating to moped owners throughout the country. During the enquiries, which were carried out by the Institute of Social-Scientific and Economical Research ISEO, data were collected on: — the ownership of mopeds and of crash helmets, and the use thereof; the attitude towards the legal obligations of wearing crash helmets; and knowledge concerning the publicity campaign. Special enquiries were held in the provinces of Groningen and Overijssel, in order to ascertain the effect of the special campaign activities in Groningen.

Semi-annual road-side counts have also been carried out relating to the use of crash helmets by moped riders.

When the results of all four enquiries are available, SWOV will make an extensive analysis of them. After each enquiry a preliminary report is submitted to the Steering

group for the Publicity campaign on moped riders' crash helmets. Due to problems arising in connection with the implementation of the measure for the compulsory use of helmets by moped riders, (confusion about the helmets' quality causing postponement of the compulsory use of the helmets), the original aim of the investigation (the evaluation of the campaign) became somewhat less important.

2. Quality of helmets for moped and motorcycle riders

SWOV was actively involved in the investigation carried out by Governmental Authorities into the quality of helmets, which resulted from a publication of the Royal Dutch Touring Club ANWB and the Dutch Consumers' Association. SWOV also provided advice, in relation to quality requirements, based on data collected from earlier investigations.

Vehicle characteristics of importance in reducing severity of injuries

The important results from the SWOV accident investigation were reported in the form of a paper which was presented at the Medical Congress of Traffic Medicine of the Dutch Association of Doctor-Motorists VVAA, Utrecht (see page 28). This paper discusses some medical aspects of the differences in the patterns of injuries sustained by drivers using various types of seat belts and drivers not using seat belts.

Also, in 1974, enquiries were organised concerning the fitting of seat belts in cars and their use; these enquiries were made during the months of July and October, in both built-up and rural areas.

Results from the accident investigation and the enquiries, have been used by the Interdepartmental working group Seat belts and the Steering group for Information concerning seat-belts. The activities carried out for the Interdepartmental working group Seat belts were completed by the middle of 1974.

After processing some of these data SWOV compiled a document, which will be published, in conjunction with the Dutch Road Safety Association VVN in the spring of 1975.

With a view to preparing a new accident investigation in 1975, a start has been made on a study, for improving the coding of injuries.

Roadside safety structures/Safety structures on bridges

A preliminary investigation into the possibility of an evaluation investigation into the effect of roadside safety structures, showed that it is very difficult (or may even be impossible) to collect a sufficient quantity of data concerning the accidents which are connected with roadside safety structures.

In order to obtain some information about the possibilities of various types of roadside safety structures, a start has been made on a study, by applied mathematical simulation, and, where necessary, by practical tests.

The energy crisis and road safety in November and December 1973

At the end of 1973, the Minister of Transport and Waterways instructed SWOV to carry out investigations into the effects on road safety during November and December 1973, of the measures taken and the recommendations made at the end of October 1973. This investigation was completed during the second half of 1974, and the Minister was given the information about the observed effect on road safety.

This investigation was carried out with the co-operation of various specialist institutions, which had the information at their disposal, such as: the Central Bureau of Statistics in the Netherlands CBS, the Traffic and Transportation Engineering Division of Rijkswaterstaat DVK, the Provincial Bureaus of Public Works, the Royal Dutch Meteorological Institute KNMI, the Netherlands Railway Company and Local authorities.

Integrated road accident recording

In 1973 SWOV set up a project for a research evaluation relating to an experimental method of recording road accidents; in this, the questionnaires completed by the police, and the damage-claim questionnaires, were combined. The aim of the project was to obtain a forecast of the data which would have to be qualitatively processed by the Road Accident Recording Department VOR. When planning the investigation, it was not possible to establish definitely, which projects would have an influence on the expected results. Since, however, VOR (which was to be established on the 1st January 1975 in Heerlen) required indispensable technical-organisational data, a trial-investigation was established to gain useful experience in this field.

The numerical data from this investigation were analysed by SWOV at the request of the Ministry of Transport and Waterways. The results proved, that due to the effects of the energy crisis (e.g. traffic-free Sundays) the results of the test obtained for the recording were not representative of the results VOR expected to obtain, under normal circumstances; moreover, the new type of damage-claim questionnaire is not yet being correctly used by road users.

It is desirable that this evaluation research should be continued when the new damage-claim questionnaires are used in sufficient quantities, and are completed in the required manner, so that they can be processed by VOR.

A series of lectures was held, dealing with the recording of road accidents, within the framework of the traffic-technical courses of the Royal Dutch Touring Club ANWB.

Medical records

Due to a modified order of priorities it has not yet been possible to complete the report on investigations in this field, carried out in Rotterdam.

Records of accident, road and vehicle characteristics

These activities will be undertaken towards the end of 1975.

Other SWOV activities

International co-operation

SWOV participated in the work of the following international committees:

European Communities

Scientific and Technical Research Committee (CREST), Committee for Medical Research and Public Health (Ad hoc Working Group on Toxic and Psychological Factors in Road Traffic Accidents)

Commission International de l'Eclairage (CIE)

T.C. 1.6. Fundamentals of Visual Signalling

T.C. 4.6. Public Lighting (Working Group Glare; Working Group Fundamentals; Working Group Tunnel lighting)

International Committee on Alcohol, Drugs and Traffic Safety

NATO-Committee on the Challenges of Modern Society (CCMS)

Pilot Study on Road Safety

Accident Investigation Study

Project Group on Pedestrian Safety

Organisation for Economic Co-operation and Development (OECD)

Steering Committee for Road Research

International Road Research Documentation (IRRD)

Research Groups:

Lighting, Visibility and Accidents (Ad hoc Committee on the Application of Polarized Headlights)

Road Safety at Junctions in Urban Areas

The Effects of Roadside Obstacles on the Frequency and Severity of Accidents

Driver Education and Training

Driving in Reduced Visibility Conditions due to Adverse Weather Conditions

Hazardous Road Locations: Identification and Countermeasures

Visual Effectiveness and Durability of Road Markings, Reflectors and Delineators

Semi independent:

Working Group on Pedestrian Safety

Working Group on Crash Barriers

Working Group on the Effects of Alcohol and other Drugs on Driver Behaviour

In 1974, in addition to congresses and meetings of international working groups and commissions on which SWOV is represented, SWOV participated on the following international congresses:

American Association for Automotive Medicine (AAAM) Congress, Toronto
Fifth International Technical Conference on Experimental Safety Vehicles, London
First International Conference of the Aslib Transportation and Planning Group, Southampton
International Bicycle and Pedestrian Planning and Design Seminar, London
International Conference on Dual Mode Transportation, Washington
International Conference on Research Methodology for Roadside Surveys of Drinking-Driving, Paris
International Research Committee on Biokinetics of Impacts (IRCOBI) Conference 'Biomechanics of Trauma in Children', Lyon
2nd IFAC/IFIP/IFORS Symposium on Traffic Control and Transportation Systems, Monaco
Symposium 'Blendung in der Strassenbeleuchtung', Zürich
Symposium on Emergency Medical Training, New Haven
Symposium 'The Design of Traffic Networks in Theory and Practice', Göteborg
Seminar 'Unfallursachenermittlung am Kraftfahrzeug', Köln

In addition to those already mentioned, SWOV has been in contact with many scientific and governmental establishments all over the world. In fact, they are so numerous that it would be difficult to mention them all.

Also in this year, the greatest number of contacts were made, with the United States (43), followed by Germany (33), England (32) and Australia (24).

SWOV was also approached, in connection with aspects of road safety, by institutions, universities and governmental authorities from Belgium, Canada, Cuba, Denmark, France, Finland, India, Ireland, Israel, Italy, Yugoslavia, Japan, New Zealand, Norway, Austria, Portugal, Syria, Turkey, South Africa, Sweden and Switzerland.

During the year under review SWOV received several groups of visitors from abroad. They were representatives of:

the National Institute for Road Research, South Africa;
die Arbeitsgruppe Wegweisung und Leiteinrichtung der Forschungsgesellschaft für das Strassenwesen, Germany;
Nippon Sheet Glass C. Ltd., Japan;
the Pedestrian/Bicycle Safety Project of the U.S. Department of Transportation, USA;
the Bicycle and Pedestrian Transportation Researchcenter, Drexel University, USA;
the University of New South Wales, Australia;
das Bundesverkehrsministerium, Germany;
the Swedisch Road Safety Office, Sweden;
the Environmental Design and Control Division Federal Highway Administration Department of Transportation, USA.

Documentation and the Library

There has been a steady growth of the library collection during this year also. Consequently the use of the documentation and library facilities by researchers, students and other people from outside the Institute increased considerably.

Within the framework of the International Road Research Documentation (IRRD) co-operation has been achieved to improve the accessibility of world literature in the field of traffic in general and, more particularly, in the field of traffic safety. Partly due to the initiative of the Dutch Authorities, the possibility of extending the operational scope of IRRD is being explored.

The magnetic tapes prepared by IRRD are being indexed over a trial period. The 'interest-profiles' of a number of Dutch institutions working in the field of road research will be matched against the incoming tapes in an experimental phase.

Collection of basic data

The collection, processing and analysis of basic data concerning road accidents, vehicle fleets, traffic performance and composition, driving speed, personal characteristics and quantifiable behaviour and characteristics of road users, was continued throughout the year under review.

Collection of basic data, was again of great importance for the preparation of literature studies, recommendations, data statements and other means of providing information on the above subjects.

Information

Also in 1974 the Information Department played a large part in the dissemination of information. 2047 publications were sent out on request. Actual traffic problems and incidents, caused the publicity media to seek more detailed information from SWOV. SWOV participated in the exhibition 'Intertraffic '74' with an information stand, and also by showing films, in a spacious film theatre. In this 'walk-in theatre', which was nearly always completely full, the following SWOV-films were shown: 'Submerging vehicles', 'Collisions with some obstacles', 'Crash barriers in soft soil', 'Crash barriers for bridges' and 'Experiments on tyres and road surfaces', both in Dutch and English versions. Subsequently SWOV publications were handed out in large numbers, and much verbal information given to visitors from home and abroad.

There is still great interest in the film 'Submerging vehicles', which was released on February 17, 1972, and was based on the SWOV investigation under the same title. This film was lent out 50 times to various institutions by the Foundation Film and Science. A part of this film was incorporated in the film 'Emergency driving tactics', produced by Aims Instructional Media Services Inc., Hollywood.

Publications, papers and other contributions

Publications

Jaaroverzicht 1973. Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, 1974. 37 blz.

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De energiecrisis: de invloed van beperking van verlichting op de verkeersveiligheid. Dr. ir. D. A. Schreuder. *Verkeerstechniek* 25 (1974) 1 : 10 - 13. Ook: *De Ingenieur* 86 (1974) 3 : 50 - 53.*

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Functionele eisen van een toekomstig verkeerssysteem. Ir. E. Asmussen. In: *Intertraffic 74*, Internationaal Congres over Verkeerstechniek 'Beheerst Verkeer', Amsterdam, 15 en 16 mei 1974, blz. 3 t/m 56 (incl. 3 Bijlagen). RAI, Amsterdam, 1974.

Een beslissingsmodel voor beleidsmaatregelen. Ir. F. C. Flury. In: *Intertraffic 74*, Internationaal Congres over Verkeerstechniek 'Beheerst Verkeer', Amsterdam, 15 en 16 mei 1974, blz. 57 t/m 88. RAI, Amsterdam, 1974.

Functional requirements of future traffic systems. E. Asmussen. In: *Intertraffic 74*, International Congress on Traffic Engineering 'Controlled Traffic', Amsterdam, 15 and 16 May 1974, pp. 3 - 53 (3 Appendices incl.). RAI, Amsterdam, 1974.

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Empfehlungen für Blendungsbegrenzung in der Strassenbeleuchtung. D. A. Schreuder. *Lichttechnik* 26 (1974) 4 : 180 - 184.

Oversteekplaatsen voor voetgangers. J.H.Kraay & M.Slop. *Verkeerstechniek* 25 (1974) 7 : 356 t/m 361.*

Practical and medical aspects of the use of car seat belts: Tentative views from recent research by the Institute for Road Safety Research SWOV. A.Edelman & L.T.B.vanKampen. Paper presented at the Medical Congress on Traffic Medicine; Celebration of the 50th Anniversary of the Dutch Association of Doctor-Motorists V.V.A.A., Utrecht, 30 May 1974. *Arts en Auto* 40 (1974) 19 (Congresnummer) (12 oktober) : 1556 - 1559.

Countermeasures in the field of human factors in relation to pedestrian behaviour, regulations and law enforcement. J.H.Kraay. In: Pedestrian safety project. Committee on the Challenges of Modern Society CCMS Report No. 27, pp. 34-48. U.S. Department of Transportation, 1974.

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Auto te water. [H.vanderKlei]. *Mensen van Nu* (1974) 5 (aug.) 53.*

Waarom, waar en wanneer verlichten? Dr. ir. D. A. Schreuder. *Elektrotechniek* 52 (1974) 12 (Economisch nummer 3) (september) : 662-663.*

Oversteekplaatsen voor voetgangers; Studie gebaseerd op bestaande Nederlandse en buitenlandse literatuur. SWOV (J.H.Kraay). Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, Voorburg, 1974.*

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Karakteristieken van het wegverkeer; Ter inleiding van de preadviezen van ir. S.T. M.C. Janssen en dr. ir. D.A. Schreuder. In: Wegontwerp en wegverlichting tegen de achtergrond van de verkeersveiligheid; Preadviezen Congresdag 1974, Utrecht, 6 december 1974, blz. 5 t/m 11. Vereniging Het Nederlandsche Wegcongres, 's-Gravenhage, 1974.*

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De rol van functionele eisen bij de wegverlichting. Dr.ir.D.A.Schreuder. In: Preadviezen Congresdag 1974, Utrecht, 6 december 1974, blz. 111 t/m 137. Vereniging Het Nederlandsche Wegcongres, 's-Gravenhage, 1974.*

Wit of geel licht?; Argumenten bij de discussie omtrent de lichtkleur van auto-koplantaarns 1. Dr.ir.D.A.Schreuder. Verkeerstechniek 25 (1974) 12 : 638 t/m 640.*

De voetganger en de verkeersveiligheid. SWOV (J.H.Kraay, soc. drs.). Publikatie 1972-2N. Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, Voorburg, 1974. 58 blz., geïll.*

Institute for Road Safety Research SWOV; Aims and activities. SWOV. Publication 1974-3E. Institute for Road Safety Research SWOV, Voorburg, 1974. 36 pp.

Instrumentatieproblemen bij car-following onderzoek. SWOV (H.Botma). Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, Voorburg, 1974.

Problems of instrumentation in car-following research. SWOV (H. Botma). Institute for Road Safety Research SWOV, Voorburg, 1974.

Papers

Next to those already published in 1974 SWOV delivered the following papers:

Mr.P.C.Noordzij presented to the International Conference on Research Methodology for Roadside Surveys of Drinking-Drivering, Paris, 22-24 May 1974, a paper on Research activities in the Netherlands.

At the International Conference on Alcohol, Drugs, and Traffic Safety, in Toronto, Canada, held on 8-13 September 1974, Mr.P.C.Noordzij, presented two papers: Drinking and driving in the Netherlands over a four year period, and Comparison of blood and breath testing under field conditions.

Mr.J.H.Kraay, read a paper at the Symposium 'The Design of Traffic Networks and Practice', held in Gothenburg, Sweden, on 9-10 September 1974.

At the Symposium 'Blendung in der Strassenbeleuchtung', held in Zurich 9-10 September 1974, Mr.D.A.Schreuder read a paper 'Funktionelle Erfordernisse für Systeme der Blendungsbegrenzung'.

Mr.D.A.Schreuder also contributed to the APLE-IES Symposium on Tunnel Lighting, which was held in London on 10th December, 1974, a paper Fundamental visual problems in tunnels.

Other contributions

Driver education and training; Introduction. Contributed to OECD Research Group S10. (R. Roszbach). Oktober 1974.

Some formal aspects of data collection. Contributed to OECD Research Group S12. (S. Oppe). 1974.

A short review of the method of investigation used in a recent black-spot study in 'De Beemster'. Contributed to OECD Research Group S12. (S. Oppe). 1974.

Vehicle lighting within built-up areas (Shortened version). Contributed to OECD Research Group S2. (D.A. Schreuder). 1974.

Eclairage et signalisation dans les agglomerations (Version abrégée). Contribution à OCDE Groupe de travail S2. (D.A. Schreuder). 1974.

Road traffic control signals; Chapter 2: Fundamental aspects. Contributed to CIE TC 1.6: Fundamentals of visual signalling, Subcommittee on Signals. (D.A. Schreuder). October 1974.

Driving in reduced visibility conditions due to adverse weather; Chapter III.2: Functional requirements of remedial measures. Contributed to OECD Research Group S11. (D.A. Schreuder). September 1974.

Driving in reduced visibility conditions due to adverse weather. Background paper contributed to OECD Research Group S11. (D.A. Schreuder). 1974.

A comparative investigation in Delft into pedestrian safety in the residential districts of Gillis and Fledderus. Contributed to OECD Semi-independent Working Group on Pedestrian Safety. (J.H. Kraay & V.A. Güttinger). September 1974.

International Road Research Documentation scheme in the Netherlands; Outline of the statement to the IRRD Plenary Meeting, Cologne, 9-11 October 1974. (J.F. Demmenie). October 1974.

* Only available in Dutch